

PESTS

and

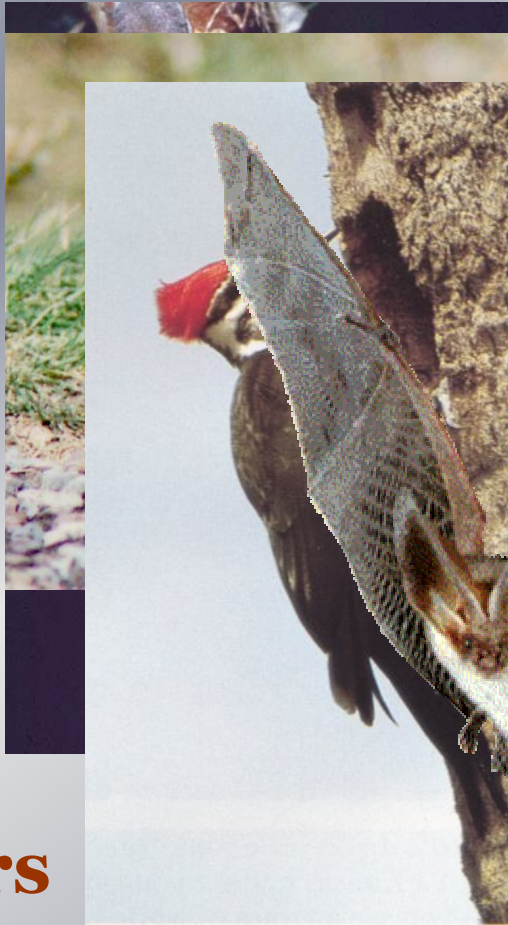
PEST CONTROL

I. The Need for Pest Control

- **Pest** =
 - Any organism that is destructive or troublesome
 - **Agricultural pests** =
 - Organisms that feed on plants, agricultural crops, or animals
 - **Weeds** =
 - Plants that compete with agricultural crops, forests, and other important plants for light and nutrients

VARIOUS PESTS

- Insects
 - Aphids
 - Caterpillars
 - Hornets
- Rodents
 - Chipmunks
 - Moles
 - Rabbits
- Birds
 - Woodpeckers
 - Pigeons
- Bats



INTRODUCED SPECIES

- Not native to the area
 - Introduced by humans
- Problems
 - May not encounter natural enemies
 - Population may explode
 - May eat organisms we don't want them to
 - Destroy crops and other plants
 - May disrupt balance in an ecosystem
- Examples
 - Rabbits in Australia
 - Japanese beetle
 - Gypsy moth



- 3 purposes for bringing pests under control
 1. Protect our food
 2. Protect our health
 3. Convenience
-



• **Herbicides** =
– Chemicals that kill plants

• **Pesticides** =
– Chemicals that kill animals
and insects considered
to be pests

Integrated Pest Management

- 🐝 Long-term management approach to control pest populations
- 🐝 Uses all suitable methods
 - 🐝 Chemical
 - 🐝 Ecological
- 🐝 Minimal environmental impact



II. Problems with the Chemical Approach

1. Human health effects
2. Environmental effects
 - DDT caused birds to lay fragile eggs
3. Development of Resistance by pests

4. Resurgences and secondary-pest outbreaks

- **Resurgence** =
 - Rapid comeback of a population and return to even higher levels than before the treatments
- **Secondary-pest outbreak** =
 - Small population of pests suddenly explodes to become a serious problem


III. Alternative Pest Control Methods

- **Natural Pest Control** =
 - Controlling a pest population without synthetic chemicals
 - 4 general categories
 - A. Cultural Control
 - B. Control by Natural Enemies
 - C. Genetic Control
 - D. Natural Chemical Control




A. Cultural Control


 Non-chemical alteration of environmental factors

 Pest finds the environment unsuitable or is unable to gain access to its target

 Examples




 Disposing properly of sewage




 Putting screens on windows

 Putting fences around yards/gardens

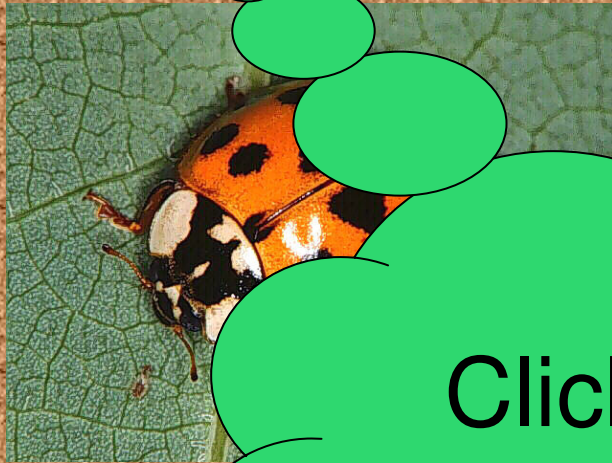
 US Customs Bureau

B. Control by Natural Enemies

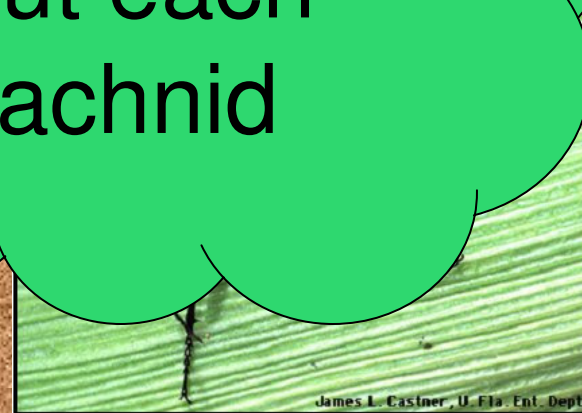
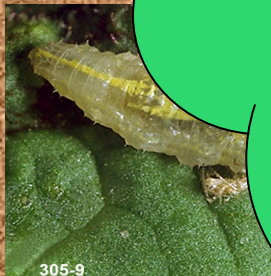
-  Various caterpillars controlled by parasitic wasps
-  Rabbits controlled by virus
-  Water hyacinth controlled by Brazilian weevils

-  Problems:
 -  Want organism to control target species and not attack other species
 -  Natural enemies could overpopulate

Most Wanted!



Click the buttons
below to learn
more about each
insect/arachnid

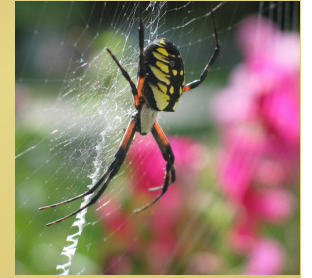


LADY BEETLES



- Alias:
 - Lady bugs, Ladybird beetles
- Adults
 - Red, orange, or tan with tattooed black spots on wing covers
- Larvae
 - Disguised as tiny alligator
 - Generally black with orange markings
- Wanted for:
 - Attacking aphids, mites, insect eggs, and small insects
- Reward:
 - Aphid-free roses and vegetable

SPIDERS



- Identifying marks:
 - 8 legs
 - 2 body parts
 - Known in many colors and disguises
- Wanted for:
 - Kidnapping insects
 - May be active hunters or use web traps
 - Can be found almost anywhere
- Last seen:
 - Headed for your garden

SYRPHID FLIES



- Alias:
 - Hover flies, Flower Flies
- Identifying marks:
 - Harmless adults
 - Often found disguised as bees
 - Found pollinating flowers
 - Larval maggots
 - Small, legless, slug-like
- Larvae wanted for:
 - Attacking aphids

GROUND BEETLES



- Alias:
 - Carabids
- Identifying marks:
 - Large, dark, sometimes metallic beetles
 - May be moving fast along ground
- Wanted for:
 - Preying on many low-dwelling soft-bodied insects

C. Genetic Control

- Control with chemical barriers
 - Plant produces a chemical that kills pest or tastes/smells bad
- Control with physical barriers
 - Selective breeding for physical features that prevent pest from reaching part of plant
 - Hooked leaf surfaces
 - Sticky substances

- Control with sterile males
 - Can't reproduce
 - Numbers drop
- Strategies using biotechnology
 - Genetically engineering plants with resistance

D. Natural Chemical Control

- **Hormones** =
 - Natural chemical substances that control development and behavior of organisms
- **Pheromones** =
 - Natural chemical substances produced by certain members of a species that affect the behavior of other members of the same species

- Use hormones and pheromones to disrupt insect's life cycle
- Benefits
 - Nontoxic
 - Species-specific